SCHOOL-WORK AND AFTER-LIFE.

THE problem of bringing school curricula for boys and girls into closer relation with their probable after-school activities has been discussed at recent educational conferences, and I wish to direct attention to three particular cases of the problem:—(1) technical training of boys before apprenticeship to a trade, or attendance at technical institutes; (2) scientific training of boys between ages sixteen and eighteen, preliminary to a medical or engineering course; (3) science teaching of girls with a view to domestic application of the principles and skill acquired.

L.C.C. Conference: Junior Technical Schools.

(1) A session of the London County Council Teachers' Conference was devoted to the subject of junior technical schools for boys. The attendance was large—more than 2200 applications for tickets admitting to the conference having been made to Dr. Kimmins, who was responsible for the organisation of the meetings—and the chair was taken by Mr. F. C. Ogilvie, principal assistant-secretary at the Board of Education for Technology and Higher Education in Science and Art. The chairman said that the present need was a clear statement of accomplishment. The question of the leaving age and the different necessities of localities made the determination of the curriculum a wide problem, so that there could not be a sealed pattern of a junior technical school. Mr. T. Luxton described the system adopted at the Hull Technical Institute, where the boys were admitted after twelve years of age and stayed for two and a half years. Two-thirds attended the commercial side, the remainder the engineering and science side. More than 90 per cent. of the boys came from the elementary schools, and the net effect was to lengthen their school life by about two years.

Mr. F. Jeffery gave an account of the methods adopted at the Stanley Technical Trade Schools, Norwood. Experience at many technical institutions had shown that when a working lad or man returns from a fatiguing day's work he has little energy left to go to a higher school, and the founder of these schools recognised that technical education must begin at an earlier age. Being himself a technical manufacturer, he became convinced that much could be done to develop the originality and skill of boys by taking them *at a compulsory school age* and giving them a taste for practical science and mechanics. He said:—"If we can so prepare our boys that they will be coveted as apprentices by our technical manufacturers, I am sure this will raise the standard of our work." Boys are admitted between twelve and thirteen years of age, and devote half their time to general subjects and half to workshop practice. This system has the economical result that the teaching staff for 300 boys is only that required for 150 in each division, or, in other words, the total teaching staff is not increased by the addition of workshop instruction. The system of fees is unique. The fee for the first year is one shilling per week; those "students" who make satisfactory progress are elected "junior scholars," and pay no fees for the second year. In the third year they may be elected "scholars," and will then be paid a small consideration for their mechanical work if it be of commercial value. Mr. Jeffery claimed that the class-room studies did not suffer in quality, though somewhat restricted in range. His Majesty's inspector reported:—"One justification of the special feature of the school, in devoting half the working time to practical workshop instruction, is seen in the keenness and vigour with which all the work is carried on, and the evident interest which the students take in their studies."

After giving a useful account of the details of this valuable educational experiment, Mr. Jeffery stated the aim of the school to be that of preparing lads to be skilful, scientific, and artistic mechanics, and to make them anxious to continue their studies at polytechnics so as to become skilled artisans fitted for good positions in their industries. When such a result has been achieved, schools of this type are likely to become an integral part of the educational system of the country. Then the status of the British artisan and the standard of his work will be raised. Mr. R. Bunting would leave trade schools to the polytechnics. The ordinary day school should give such a general education that the children would be prepared to take *immediate* advantage of the special facilities offered by the regular trade schools. From a recent analysis of a record which he had kept of the boys leaving the Acland School (Kentish Town) during the past five years, he found that the boys of greater mental power were also more capable in all intelligent motor exercises, including manual work. Lads liked manual work; such work was specially valuable in cases of slow development, leading to a marked increase in their general mental development concomitant with their growth in skill.

It was well that a conference of teachers should discuss this problem, and it is all to the good that they are endeavouring to link the work in the schoolroom with the after-school employments of their boys, but personally I am convinced that the time is ripe for legislation which should make it illegal to employ young persons unless they are working in the capacity of learners of industry. A recent Act has established this principle for Scotland—why should England lag behind?

Preliminary Scientific Instruction of Medical and Engineering Students.

(2) The General Medical Council refuses to recognise the leading secondary schools as places where the preliminary training in chemistry and physics may be given to medical students, notwithstanding the fact that the Conjoint Board of Physicians and Surgeons grants such recognition. It is alleged that the council wishes the students to learn "medical chemistry" and "medical physics." As already reported in NATURE of January 21, the Public Schools Science Masters' Association condemned the action of the General Medical Council, as boys have been removed from school in consequence of the non-recognition stated above, although it is not clear that this non-recognition by the General Medical Council is of the slightest practical consequence. During the debate the wider issue was raised as to whether a boy intended for a scientific profession should leave school at seventeen or remain another twelve or eighteen months and devote his main energies to science studies. Prof. Armstrong spoke in favour of compelling all boys to leave school at seventeen, but the majority of those present were of the opposite opinion. Nothing was said about the boys who reach the age of seventeen without reaching the position in the school appropriate to that age; but, unfortunately, such cases are far from rare, and it is, in the writer's opinion, very dubious policy to keep such youths longer at school; transplanting offers the better chance of growth; but for the abler and more industrious the age of seventeen is a critical period in mental development. At this epoch the boy has begun to feel his feet, to take his stand on general scientific principles, and sees before him an inspiring and unlimited vista of future study. Is it advisable to remove him at this moment from the instructor whom he understands, and who understands him? Is it prudent to exchange the individual tuition with constant questioning and supervision, the homely apparatus which does not obscure the idea and purpose of its construction, for the large classes, the diminished or evanescent tutoring, the elaborate lecture appliances of the technical college? Moreover, it is necessary to consider how far the youth is matured in character, as the possibility of a wrecked career is not negligible when a youngster has to be sent from a boarding-school and a country home to live as a medical student in London or in a great industrial city.

On the other hand, it has been urged, and Prof. Armstrong stated this view as a result of his personal observation, that character is strengthened by removing the youth of seventeen from too tender tutelage, and that the prolongation of such tutelage hinders the growth of resourcefulness, initiative, and relf-reliance. To the writer it seems necessary to distinguish between two parallel courses:—(*a*) public school followed by Oxford or Cambridge; (*b*) town school followed by day college, with residence at home. The transfer from school to college may perhaps be a year earlier for (*b*) than (*a*). It is worth pointing out that high academic distinctions often bring a rich reward in later years, and that to shorten the course

before the degree is to pit a man against competitors a year older.

As regards "medical chemistry" or "medical physics," it should be stated, clearly and with emphasis, that we want students to be grounded in the fundamental principles of chemistry and physics, and that "medical physics" is an utter delusion. A competent teacher will use such illustrations as will bring his teaching into close relation with the interests and ambitions of his pupils, whether medical, engineering, or other. Only in this sense can we allow any branch of science to be "medicated."

Domestic Training and Science for Girls.

(3) The Incorporated Association of Assistant Mistresses in Public Secondary Schools devoted the afternoon of their twenty-fifth annual meeting to a discussion of the science curriculum for girls. Miss Laurie (Cheltenham Ladies' College) read a paper dealing with the principles to be followed in planning a science course. They wanted to train children in scientific method and management; they should not cram facts, but develop faculties. Much depended upon proper grading of experimental work, and it was important to use simple apparatus. There was a danger of providing technical education without a scientific training. This led to the British workman being beaten by the German.

Miss Wood (Leeds Girls' High School) described a course of "science applied to domestic life" which had been carried out at Leeds. In addition to laboratories for chemistry and physics, the school possessed a "kitchen laboratory." Her object was to make common things and ordinary phenomena the very centre of the teaching, to develop scientific principles, and inculcate the scientific habit in the closest possible connection with the facts of everyday life. The household, and above all the kitchen, abounded in things and problems that could be made the object of simple scientific inquiry; their study stimulated the interest of girls. For a home task Miss Wood had set high-school girls to clean the flues of the kitchen range, light the fire, and arrange to have the water hot. In that sort of way the cooperation of home and school was secured.

During the discussion which followed several speakers feared the danger of making scientific instruction too utilitarian; the domestic training might be acquired at the expense of, and not in addition to, the training in exact thinking.

So great a majority of girls will become better and more efficient women by acquiring domestic knowledge and skill, and the spread of such acquirements is so important to national physique, that there can be little hesitation in encouraging domestic training in our girls' schools—it being obvious that in very many cases the home cannot meet the need; but in actual laboratory work the choice of subject and method must have unity of aim. Which is to be the dominant ideal in the teacher's mind? Some experience of girls' schools, and a careful observation of the plan pursued in some of the most successful technical classes, lead me to suggest that it will be found best to develop a *science* course, using domestic phenomena for illustrations wherever suitable, to be followed in the last year by a course frankly and directly aiming at *domestic* training, parallel with, or in place of, the science course. This would mean that science and domestic training would be correlated, but have separate places in the time-table.

G. F. D.

A PROPOSED NORTH POLAR EXPEDITION.

AT the meeting of the Royal Geographical Society on January 25 Captain Roald Amundsen read a paper explaining his plans for a proposed north polar expedition. Mr. Amundsen urges the necessity for another crossing of the Arctic Ocean, not merely in order to gain further knowledge of the ocean itself, but to study the general problems of oceanography with the greatly improved methods which have come into use since the date of the *Fram* expedition, under the favourable conditions of an ice-covered sea, which gives a fixed undisturbed surface from which to work. He brings forward in his paper many interesting examples of the progress which has been made during the last twelve years in improving the apparatus and methods of deep-sea investigation, and many arguments in support of his contention that the polar ocean offers unequalled opportunities for settling vexed questions connected with the cause of currents, the effects of tidal action, the reciprocal action of plants and animals at various depths, and so on. A thorough examination of Nansen's old ship, the *Fram*, has shown that the vessel is, or can easily be made, as sound as ever, and fit for another voyage similar to that of the famous expedition of 1893–6.

The plan of the expedition is stated as follows:—"With the *Fram* equipped for seven years, and a capable crew, I shall leave Norway in the beginning of 1910. We shall make for San Francisco round Cape Horn, taking in coal and provisions at the former place. We shall then shape our course for Point Barrow, the most northerly point of North America, which I hope to reach by July or August. From this place the last news will be sent home before the real voyage begins. On leaving Point Barrow it is my intention to continue the voyage with as small a crew as possible. We shall then make for the drift-ice in a direction north by north-west, where we will then look for the most favourable place for pushing farther north. When this has been found we shall go as far in as possible, and prepare for a four or five years' drift across the Polar sea. Throughout our voyage up to this point, I intend to make oceanographic observations; and from the moment the vessel becomes fast in the ice, a series of observations will be begun, with which I hope to solve some of the hitherto unsolved mysteries. What I expect to find in the unknown part of the Polar sea I will say nothing about at present. Some people have put forward theories of great masses of land, others of small. I ought perhaps also to have put forward my theory, but think it wiser to refrain from doing so until I have investigated matters at closer quarters."

THE GEOLOGICAL SOCIETY OF GLASGOW

THE jubilee of the Geological Society of Glasgow was celebrated on January 28, when a conversazione was held in the University of Glasgow. An address was delivered by Sir Archibald Geikie, K.C.B., president of the Royal Society, and now the senior member of the Glasgow society. Prof. J. W. Gregory, F.R.S., the president, said the Geological Society of Glasgow has been fortunate in its roll of distinguished members. For twenty-two years the late Lord Kelvin was its president. The name which has been longest on the list of members is that of Sir Archibald Geikie. In 1862 he read to the society a paper which occupied three-fourths of the first volume of the Transactions, and at once lifted British glacial geology on to a new plane.

Sir Archibald Geikie, during the course of his address, said it was not until some fifty years ago that the number of men following a geological bent grew large enough in Glasgow to call for the formation of a geological society. It is a curious fact, he said later, that some of the earlier writers on Scottish geology were foreigners, some of them having been attracted to this country by the fame of the wonders of Staffa and the Western Isles. One of the earliest and most celebrated of these visitors was the Frenchman Faujas de Saint-Fond, who in the year 1784 travelled from the south of France to see the marvels of Fingal's Cave. On his way back from the West Highlands Faujas de Saint-Fond passed through Edinburgh, and met there the illustrious James Hutton, who, he tells us, "was at that time engaged, in the calm of his study, writing a work on the theory of the earth." Little could the French traveller have divined that "this modest philosopher," as he called him, would in after years be universally acclaimed as one of the great founders of modern geology. In the year 1819 there appeared the monumental "Description of the Western Islands of Scotland," by John Macculloch, in